TEST REPORT

EN 62040-1:2008

Uninterruptible power systems (UPS) -- Part 1: General and safety requirements for UPS

Report reference No	WTS14S0513591S
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Applicant's Name	Guangdong East Power Co., Ltd
Address	NO.6 NORTHERN INDUSTRY ROAD, SONGSHAN LAKE SCI&TECH INDUSTRY PARK, DONGGUAN, P.R.CHINA

Standard	EN 62040-1:2008
Test Report Form No.	IEC62040_1_1A
TRF originator	SGS Fimko Ltd
Master TRF	dated 2003-03
Copyright blank test report	The bodies participating in the Committee of Certification Bodies (CCB) and/or the bodies participating in the CENELEC Certification Agreement (CCA).

Test procedure	CCA-scheme
Procedure deviation	N.A
Non-standard test method	N.A

Type of test object	Uninterruptible Power Systems
Trademark	N.A
Manufacturer	Guangdong East Power Co., Ltd
Model and/or type reference	2000VA, 2200VA, 3000VA
Serial number	Engineer sample, no serial number
Rating(s)	See page 3 model list

General descriptions:

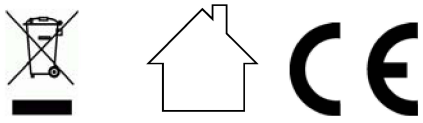
The subject models are the Uninterruptible Power Systems. The maximum ambient temperature specified by the manufacturer is 40°C.
All tests were performed on provided test samples and found that they complied with the requirements of the standards.
Both models have two plastic panel: LCD panel and LED panel; power connection to the mains mode: a detachable power cord and non-detachable power cord.
Tests performed on model 3000VA with LCD panel to indicate the model 2000VA, 2200VA.

Model difference:

Model / Place	2000VA 2200VA	3000VA
BATTERY	12V9AH X3	12V7AHX6
Transformer	EI 133 X 80	
Dimension W X H X D	190 X 465 X 330	
PCB layout	Both models using the same PCB layout	

Copy of marking plate

Guangdong East Power Co., Ltd
Uninterruptible Power Systems
Model No: 3000VA
Input: 220-240V～, 50/60Hz, 10A
Output: 220V～, 50/60Hz, 8.0A 1ϕ with neutral



Particulars: test item vs. test requirements	
Equipment mobility ..... :	Movable
Operating condition..... :	Continuous
Tested for IT power systems ..... :	No
IT testing, phase-phase voltage (V) ..... :	N/A
Class of equipment ..... :	Class I
Mass of equipment (kg)..... :	29.0kg
Protection against ingress of water ..... :	IPX0
Test case verdicts	
Test case does not apply to the test object .:	N(.A)
Test item does meet the requirement ..... :	P(ass)
Test item does not meet the requirement ... :	F(ail)
Testing	
Date of receipt of test item ..... :	November 25, 2009
Date(s) of performance of test ..... :	November 26, 2009 to December 11, 2009

General remarks

The test result presented in this report relate only to the object(s) tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

Standard EN 62040:2008 is to be used in conjunction with IEC 60950-1:2005, which is referred to in this TRF by "RD".

Model list:

Model	Rated input voltage (V)	Rated input frequency (Hz)	Rated input apparent power(VA)	Rated input current (A)	Rated output voltage (V)	Rated output frequency (Hz)	Rated output current (A)
2000VA 2200VA	220-240	50/60	2200	7	220	50/60	5.5
3000VA	220-240	50/60	3000	10	220	50/60	8.0

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Clause	Requirement – Test	Result – Remark	Verdict
4	GENERAL CONDITIONS FOR TESTS		P
4.5	Components		P
1.5.1/RD	General		P
	Comply with IEC 60950-1 or relevant component standard	All safety critical components are certified, all components are used within their rating, plastic materials, PCBs and wiring material are UL listed, non-certified components were tested according to this standard. (See appended table 1.5.1)	P
1.5.2/RD	Evaluation and testing of components		P
1.5.4/RD	Transformers	Transformer complies with the relevant requirements of the standard and particularly with Annex C/RD.	P
1.5.5/RD	Interconnecting cables		P
1.5.6/RD	Capacitors in primary circuits ..... :		N
1.5.7/RD	Double insulation or reinforced insulation bridged by components	No such components	N
1.5.7.1/RD	General		N
1.5.7.2/RD	Bridging capacitors	No such capacitors	N
1.5.7.3/RD	Bridging resistors	No such resistors	N
1.5.8/RD	Components in equipment for IT power systems	Not for IT power systems	N
4.6	Power interface		P
1.6.1/RD	AC power distribution systems	TN power system	P
1.6.2/RD	Input current	(see appended table 4.4)	P
1.6.4/RD	Neutral conductor	Neutral is identified in the equipment. Basic insulation for rated voltage between earthed parts and primary phases.	P
4.7	Marking and instructions		P
4.7.1	General		P
4.7.2	Power rating		P
	Input rated voltage/range (V)..... :	220-240	P
	Input rated current/range (A)..... :	See page 3 model list	P
	Input symbol for nature of supply (d.c.) ..... :	AC supply	N

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Clause	Requirement – Test	Result – Remark	Verdict
	Input rated frequency/range (Hz)..... :	50/60	P
	Output rated voltage/range (V) ..... :	220	P
	Output rated current/range (A) ..... :	See page 3 model list	P
	Number of output phases (1ϕ - 3ϕ) with/without neutral..... :	1ϕ with neutral	P
	Output rated active power (W) ..... :		N
	Output rated apparent power (VA) ..... :		N
	Output symbol for nature of supply (d.c.) ..... :	AC supply	N
	Rated frequency or rated frequency range (Hz):	50/60	P
	Max. ambient operating temperature range (°C)..... :	40°C mentioned in user manual.	N
	Manufacturer's name or trademark or identification mark ..... :	Guangdong East Power Co., Ltd	P
	Type/model or type reference..... :	2000VA, 2200VA, 3000VA	P
	Symbol for Class II equipment only ..... :	Class I	N
	Other symbols ..... :		P
	Certification marks ..... :		P
	Instructions for units with automatic bypass/maintenance bypass, additional input a.c. supply, or external batteries, having text "See installation instructions before connecting to the supply" ..... :	No separated bypass.	N
4.7.3	Safety instructions		P
	Guidance for installation for operator and service person ..... :	User manual	P
	Warning label with text "Isolate uninterruptible power supply (UPS) before working on this circuit"	Pluggable type A, not permanently connected UPS without internal automatic backfeed isolation	N
4.7.4	Main voltage adjustment ..... :	No such device	N
1.7.4/RD	Supply voltage adjustment ..... :		N
	Methods and means of adjustment; reference to installation instructions ..... :		N
4.5.5 1.7.5/RD	Power outlets..... :	The maximum apparent and active power of the standard appliance outlets is indicated on the rear of the enclosure adjacent to the appliance outlets. Conforming to IEC 60083.	P
4.5.6 1.7.6/RD	Fuse identification (marking, special fusing characteristics, cross-reference) ..... :	Part of appliance inlet, or fuse holder, VDE approved	P
4.5.7 1.7.7/RD	Wiring terminals		P

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Clause	Requirement – Test	Result – Remark	Verdict
1.7.7.1/RD	Protective earthing and bonding terminals ..... :	⏚	P
1.7.7.2/RD	Terminal for a.c. mains supply conductors ..... :		N
1.7.7.3/RD	Terminals for d.c. mains supply conductors ..... :		N
4.7.8	Battery terminals ..... :	Polarity is indicated (+ and -) on the batteries.	P
4.7.9 1.7.8/RD	Controls and indicators		P
1.7.8.1/RD	Identification, location and marking ..... :	Front panel	P
1.7.8.2/RD	Colours ..... :	Green, yellow and red of indicator are just for function purpose.	P
1.7.8.3/RD	Symbols according to IEC 60417..... :		N
1.7.8.4/RD	Markings using figures ..... :		N
4.7.10 1.7.9/RD	Isolation of multiple power sources ..... :	Only one supply from the mains.	N
4.7.11	IT power systems		N
1.7.2.4/RD	IT power distribution systems		N
4.7.12	Protection in building installations	Pluggable equipment type A.	N
4.7.13 5.1/RD	High leakage current (mA) ..... :	Max. 0.20mA	P
4.7.14 1.7.10/RD	Thermostats and other regulating devices	No thermostats or regulating devices used.	N
4.7.15 1.7.2.1/RD	Language(s) ..... :	English	—
4.7.16 1.7.11/RD	Durability of markings	After rubbing test by water and petroleum spirit, the label still easily discernible, indelible and legible.	P
4.7.17 1.7.12/RD	Removable parts	No removable parts.	N
4.7.18 1.7.13/RD	Replaceable batteries	Irreplaceable	N
4.7.19 1.7.2.5/RD	Operator access with a tool..... :		N
4.7.20	Battery	Pluggable type A, UPS battery is located in battery compartment. See page 2 Model difference	P
	Clearly legible information ..... :	On battery cell	P
	Battery type ..... :	Lead-acid	P
	Nominal voltage of total battery (V) ..... :	See page 2 Model difference	P
	Nominal capacity of total battery (optional) ..... :	See page 2 Model difference	P
	Warning label ..... :	On battery compartment	P

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Clause	Requirement – Test	Result – Remark	Verdict
	Instructions ..... :	User manual	P
4.7.21	Installation instructions	Sufficient information	P

5	FUNDAMENTAL DESIGN REQUIREMENTS		P
5.1	Protection against electric shock and energy hazards		--
2.1.1.2/RD	Battery compartments ..... :	Not access to TNV circuit	N
2.1.1.4/RD	Access to hazardous voltage circuit wiring	No such wiring	N
2.1.1.5/RD	Energy hazards ..... :	No energy hazard in operator area.	P
2.1.1.6/RD	Manual controls	No knob, handle, lever etc	N
5.1.1	Operator access	Only openings in sides of the enclosure. Circuits are not touchable by test pin through the openings.	P
	category a)		P
	category b)	Inaccessible to ELV wiring	P
5.1.2 2.1.1.3/RD	Access to ELV wiring	No ELV wiring in operator accessible area.	N
	Working voltage (Vpeak or Vrms); minimum distance (mm) through insulation		—
5.1.3	Discharge of capacitors in the primary circuit		N
2.1.1.7/RD	Discharge of capacitors in equipment	No X-Cap.	N
	Time-constant (s); measured voltage (V)..... :		—
5.1.4	Backfeed protection	(see appended table 5.7)	P
	Description of the construction ..... :	all-pole isolation relay	—
5.1.5	Emergency switching (disconnect) device		N

5.2	Requirements for auxiliary circuits		P
5.2.1 2.2/RD	Safety extra low voltage circuits – SELV	42.4V peak or 60V d.c. are not exceeded in SELV circuit under normal operation.	P
5.2.2 2.3/RD	Telephone network voltage circuits – TNV	No TNV circuit	N
5.2.3 2.4/RD	Limited current circuits		N
	Frequency (Hz)..... :		—
	Measured current (mA)..... :		—
	Measured voltage (V)..... :		—
	Measured capacitance (µF)..... :		—
5.2.4 3.5/RD	External signalling circuits	SELV circuit only	P

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Clause	Requirement – Test	Result – Remark	Verdict
5.2.5 2.5/RD	Limited power source		N

5.3	Protective earthing and bonding		P
5.3.1 2.6/RD	General	⏚	P
5.3.2	Protective earthing		P
5.3.3	Protective bonding		P

5.4	AC and d.c. power isolation		N
5.4.1 3.4/RD	General		N
5.4.2	Disconnect devices		N

5.5	Overcurrent and earth fault protection		P
5.5.1	General		P
2.7.3/RD	Short-circuit backup protection	Pluggable equipment type A. The building installation is considered as providing short-circuit backup protection.	P
2.7.4/RD	Number and location of protective devices....:	One protective device current fuse is located in Line.	P
2.7.5/RD	Protection by several devices	Only one used	P
2.7.6/RD	Warning to service personnel……..:	No service work necessary.	N
5.5.2	Basic requirements		P
5.5.3	Battery circuit protection.....		P
5.5.3.1	Overcurrent and earth fault protection	Installed inside with a protective device – DC Fuse	P
5.5.3.2	Location of protective devices	Fixing in fuse holder	P
5.5.3.3	Rating of protective devices	Comply 8.3	P

5.6	Protection of personnel – Safety interlocks	No such device	N
5.6.1 2.8/RD	Operator protection.....		N
5.6.2	Service person protection		N
5.6.2.1	Introduction		N

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Clause	Requirement – Test	Result – Remark	Verdict
5.6.2.2	Covers		N
5.6.2.3	Location and guarding of parts		N
5.6.2.4	Parts on doors		N
5.6.2.5	Component access		N
5.6.2.6	Moving parts		N
5.6.2.7	Capacitor banks		N
5.6.2.8	Internal batteries		N

5.7 2.10/RD	Clearances, creepage distances and distances through insulation		P
2.10.1/RD	General		P
2.10.1.1/RD	Frequency……:		P
2.10.1.2/RD	Pollution degrees……:	Pollution Degree 2	P
2.10.1.3/RD	Reduced values for functional insulation		N
2.10.1.4/RD	Intervening unconnected conductive parts		N
2.10.1.5/RD	Insulation with varying dimensions		N
2.10.1.6/RD	Special separation requirements		N
2.10.1.7/RD	Insulation in circuits generating starting pulses		N
2.10.2/RD	Determination of working voltage		P
2.10.2.1/RD	General	(See appended table 5.7)	P
2.10.2.2/RD	RMS working voltage		P
2.10.2.3/RD	Peak working voltage		P
2.10.3/RD	Clearances	(See appended table 5.7)	P
2.10.3.1/RD	General		P
2.10.3.2/RD	Mains transient voltages		P
	a) AC mains supply ……:	2500Vp	P
	b) Earthed d.c. mains supplies ……:		N

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Clause	Requirement – Test	Result – Remark	Verdict
	c) Unearthed d.c. mains supplies ……:		N
	d) Battery operation ……:		N
2.10.3.3/RD	Clearances in primary circuits	(See appended table 5.7)	P
2.10.3.4/RD	Clearances in secondary circuits		N
2.10.3.5/RD	Clearances in circuits having starting pulses		N
2.10.3.6/RD	Transients from a.c. mains supply ……..:		P
2.10.3.7/RD	Transients from d.c. mains supply ……:		N
2.10.3.8/RD	Transients from telecommunication networks and cable distribution systems ……..:		N
2.10.3.9/RD	Measurement of transient voltage levels		N
	a) Transients from a mains supply		N
	For an a.c. mains supply ……:		N
	For a d.c. mains supply ……..:		N
	b) Transients from a telecommunication network		N
2.10.4/RD	Creepage distances	(See appended table 5.7)	P
2.10.4.1/RD	General		P
2.10.4.2/RD	Material group and comparative tracking index		P
	CTI tests ……..:	Material group IIIb are assumed to be used	—
2.10.4.3/RD	Minimum creepage distances	(See appended table 5.7)	P
2.10.5/RD	Solid insulation		P
2.10.5.1/RD	General		P
2.10.5.2/RD	Distances through insulation		P
2.10.5.3/RD	Insulating compound as solid insulation		N
2.10.5.4/RD	Semiconductor devices		N
2.10.5.5/RD	Cemented joints		N

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Clause	Requirement – Test	Result – Remark	Verdict
2.10.5.6/RD	Thin sheet material - General		P
2.10.5.7/RD	Separable thin sheet material		P
	Number of layers (pcs)……:	2 layers	—
2.10.5.8/RD	Non-separable thin sheet material		N
2.10.5.9/RD	Thin sheet material – standard test procedure		N
	Electric strength test		—
2.10.5.10/RD	Thin sheet material – alternative test procedure		P
	Electric strength test		P
2.10.5.11/RD	Insulation in wound components		P
2.10.5.12/RD	Wire in wound components		P
	Working voltage ……:		P
	a) Basic insulation not under stress ……..:		N
	b) Basic, supplementary, reinforced insulation ……:		P
	c) Compliance with Annex U ……..:		P
	Two wires in contact inside wound components; angle between 45° and 90° …:		N
2.10.5.13/RD	Wire with solvent-based enamel in wound components		N
	Electric strength test		N
	Routine test		N
2.10.5.14/RD	Additional insulation in wound components		N
	Working voltage ……:		N
	- Basic insulation not under stress ……..:		N
	- Supplementary, reinforced insulation …….:		N
2.10.6/RD	Construction of printed boards		P
2.10.6.1/RD	Uncoated printed boards		P
2.10.6.2/RD	Coated printed boards		N
2.10.6.3/RD	Insulation between conductors on the same inner surface of a printed board		N

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Clause	Requirement – Test	Result – Remark	Verdict
2.10.6.4/RD	Insulation between conductors on different layers of a printed board		N
	Distance through insulation		N
	Number of insulation layers (pcs) ……..:		N
2.10.7/RD	Component external terminations		N
2.10.8/RD	Tests on coated printed boards and coated components		N
2.10.8.1/RD	Sample preparation and preliminary inspection		N
2.10.8.2/RD	Thermal conditioning		N
2.10.8.3/RD	Electric strength test		N
2.10.8.4/RD	Abrasion resistance test		N
2.10.9/RD	Thermal cycling		N
2.10.10/RD	Test for Pollution Degree 1 environment and insulating compound		N
2.10.11/RD	Tests for semiconductor devices and cemented joints		N
2.10.12/RD	Enclosed and sealed parts:	No hermetically sealed components.	N

6	Wiring, connections and supply		P
6.1	Introduction		P
6.1.2	Dimensions and ratings of busbars and insulated conductors		P
6.2	Connection to power		P
6.2.1	General provisions for connection to power	A non-detachable power supply cord or a detachable power supply cord for an appliance inlet	P
3.2.2/RD	Multiple supply connections	Single supply connection.	N
3.2.3/RD	Permanently connected equipment	Not permanently connected equipment.	N
	Number of conductors, diameter of cable and conduits (mm) ……..:		—
3.2.4/RD	Appliance inlets		P
3.2.5/RD	Power supply cords		P
3.2.5.1/RD	AC power supply cords		P
	Type ……..…..:	H05VV-F	P
	Rated current (A), cross-sectional area (mm^2), AWG ……..:	Max. 10A, 3 X 1.5mm^2	—

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Clause	Requirement – Test	Result – Remark	Verdict
3.2.5.2/RD	DC power supply cords		N
3.2.6/RD	Cord anchorages and strain relief		P
	Mass of equipment (kg), pull (N) ……..……:	100N	—
	Longitudinal displacement (mm) ……..……:	0.02mm	—
3.2.7/RD	Protection against mechanical damage		P
3.2.8/RD	Cord guards		P
	Diameter or minor dimension D (mm); test mass (g) ……..…:		—
	Radius of curvature of cord (mm) ……..……:		—
6.2.2	Means of connection	Pluggable UPS type A Only one connection	P

6.3	Wiring terminals for external power conductors		N
3.3/RD	Wiring terminals for connection of external conductors		N
3.3.1	Wiring terminals		N
3.3.2	Connection of non-detachable power supply cords		N
3.3.3	Screw terminals		N
3.3.4	Conductor sizes to be connected		N
	Rated current (A), cord/cable type, cross-sectional area (mm2) ……..……:		—
3.3.5	Wiring terminal sizes		N
	Rated current (A), type, nominal thread diameter (mm) ……..…:		—
3.3.6	Wiring terminals design		N
3.3.7	Grouping of wiring terminals		N
3.3.8	Stranded wire		N

7	Physical requirements		P
7.1	Enclosure	No carry current	P
7.2 4.1/RD	Stability	10°, no tip	P
7.3 4.2/RD	Mechanical strength	250N, 5s	P
4.2.1/RD	General		P
4.2.2/RD	Steady force test, 10 N		P

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Clause	Requirement – Test	Result – Remark	Verdict
4.2.3/RD	Steady force test, 30 N	.	P
4.2.4/RD	Steady force test, 250 N	Enclosure, 5s, no damage	P
4.2.5/RD	Impact test	1.3m	P
	Fall test	For top enclosure	—
	Swing test	For right side, left side, front side and back side	—
4.2.6/RD	Drop test; height (mm) ……:		N
4.2.7/RD	Stress relief test	70°C, 7 hours	P
4.2.8/RD	Cathode ray tubes	No CRT.	N
	Picture tube separately certified ……:		N
4.2.9/RD	High pressure lamps	No high pressure lamps.	N
4.2.10/RD	Wall or ceiling mounted equipment; force (N) ……:	Not wall or ceiling mounted equipment.	N
7.4	Construction details		P
7.4.1	Introduction		P
4.3.1/RD	Edges and corners	Edges and corners of the enclosure are rounded.	P
4.3.2/RD	Handles and manual controls; force (N) ……:	No handles or manual controls.	N
4.3.3/RD	Adjustable controls	No adjustable controls.	N
4.3.4/RD	Securing of parts		P
4.3.5/RD	Connection by plugs and sockets		N
4.3.7/RD	Heating elements in earthed equipment		N
4.3.11/RD	Containers for liquids or gases		N
4.4/RD	Protection against hazardous moving parts	No moving part	N
4.4.1/RD	General		N
4.4.2/RD	Protection in operator access areas		N
4.4.3/RD	Protection in restricted access locations		N
4.4.4/RD	Protection in service access areas		N
7.4.2	Openings	For side opening, no hazardous and energy hazard parts are located in projection area, which vertically, or within a 5 degree angle from the edges of the openings.	P
7.4.3	Gas concentration	See 7.6	P
7.4.4	Equipment movement		N

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Clause	Requirement – Test	Result – Remark	Verdict
7.5 4.7/RD	Resistance to fire	Electrical parts not likely to ignite nearby materials and the fire enclosures used	P
4.7.2/RD	Conditions for a fire enclosure	All components located in a fire enclosure and metal enclosure.	P
7.6	Battery location		P
7.6.1	Battery location and installation	Installed inside	P
7.6.2	Accessibility and maintainability		P
7.6.3	Distance	Ventilation	P
7.6.4	Case insulation		P
7.6.5	Wiring		P
7.6.6	Electrolyte spillage	VRLA battery	N
7.6.7	Ventilation		P
7.6.8	Charging voltages		P
7.7	Temperature rise		P
	Maximum temperatures	(see appended table 7.7)	P
4.5.2/RD	Resistance to abnormal heat	Ball pressure test (see appended table 7.7)	P

8	ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS		P
8.1 5.1.1/RD	General		P
5.1.2/RD	Equipment under test (EUT)		N
5.1.7/RD	Equipment with touch current exceeding 3.5 mA	Max. 0.20mA	P

8.2	Electric strength		P
5.2.1/RD	General	(see appended table 5.7)	P
5.2.2/RD	Test procedure	(see appended table 5.7)	P

8.3	Abnormal operating and fault conditions		P
5.3.1/RD	Protection against overload and abnormal operation	(see appended table 8.3)	P
5.3.2/RD	Motors	No motor	N
5.3.3/RD	Transformers	(see appended Annex C)	P
5.3.4/RD	Functional insulation.....		P
5.3.5/RD	Electromechanical components		P
5.3.8/RD	Compliance criteria for abnormal operating and fault conditions	(see appended table 8.3)	P

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Clause	Requirement – Test	Result – Remark	Verdict
8.3.1	Simulation of faults	(see appended table 8.3)	P
8.3.2	Conditions for tests		P

9	CONNECTION TO TELECOMMUNICATION NETWORKS		N
6.1/RD	Protection of telecommunication network service persons, and users of other equipment connected to the network, from hazards in the equipment		--
6.1.1/RD	Protection from hazardous voltages		N
6.1.2/RD	Separation of the telecommunication network from earth		N
6.1.2.1/RD	Requirements		N
	Test voltage (V) ..... :		—
	Current in the test circuit (mA) ..... :		—
6.1.2.2/RD	Exclusions..... :		N

6.2/RD	Protection of equipment users from overvoltages on telecommunication networks		N
6.2.1/RD	Separation requirements		N
6.2.2/RD	Electric strength test procedure		N
6.2.2.1/RD	Impulse test		N
6.2.2.2/RD	Steady-state test		N
6.2.2.3/RD	Compliance criteria		N

6.3/RD	Protection of the telecommunication wiring system from overheating		N
	Max. output current (A)..... :	N.A	—
	Current limiting method..... :	N.A	—
1.4.8/RD	Normal operating voltages ..... :		N
1.4.11/RD	Power from a telecommunication network ..... :		N
2.1.1/RD	Protection in operator access areas		N
2.1.1.1/RD	Access to energized parts		N
	Test by inspection ..... :		N
	Test with test finger ..... :		N
	Test with test pin ..... :		N
	Test with test probe ..... :		N
2.1.1.2/RD	Battery compartments ..... :		N
2.1.3/RD	Protection in restricted access locations		N
2.3/RD	TNV circuits		N
2.3.1/RD	Limits		N

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Clause	Requirement – Test	Result – Remark	Verdict
	Type of TNV circuits..... :	N.A	—
2.3.2/RD	Separation from other circuits and from accessible parts		N
	Insulation employed..... :	N.A	—
2.3.3/RD	Separation from hazardous voltages		N
	Insulation employed..... :	N.A	—
2.3.4/RD	Connection of TNV circuits to other circuits		N
	Insulation employed..... :	N.A	—
2.3.5/RD	Test for operating voltages generated externally		N
2.6.1/RD	Protective earthing		N
2.6.5.8/RD	Reliance on telecommunication network or cable distribution system		N
2.9.3/RD	Grade of insulation		N
2.10.3.3/RD	Clearances in secondary circuits		N
2.10.3.4/RD	Measurement of transient voltage levels		N
2.10.4/RD	Creepage distances		N
3.5/RD	Interconnection of equipment		N
3.5.1/RD	General requirements		N
3.5.2/RD	Types of interconnection circuits.....		N

M/RD	ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)		N
M.1/RD	Introduction		N
M.2 /RD	Method A		N
M.3/RD	Method B		N
M.3.1/RD	Ringing signal		N
M.3.1.1/RD	Frequency (Hz) ..... :	N.A	—
M.3.1.2/RD	Voltage (V) ..... :	N.A	—
M.3.1.3/RD	Cadence; time (s), voltage (V) ..... :	N.A	—
M.3.1.4/RD	Single fault current (mA)..... :	N.A	—
M.3.2/RD	Tripping device and monitoring voltage..... :		N
M.3.2.1/RD	Conditions for use of a tripping device or a monitoring voltage		N
M.3.2.2/RD	Tripping device		N
M.3.2.3/RD	Monitoring voltage (V)..... :		N

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Clause	Requirement – Test	Result – Remark	Verdict
A/RD	ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE		N
A.1/RD	Flammability test for fire enclosures of movable equipment having a total mass exceeding 18 kg, and of stationary equipment (see 4.7.3.2)		N
A.1.1/RD	Samples.....:	N.A	—
	Wall thickness (mm)..... :	N.A	—
A.1.2/RD	Conditioning of samples; temperature (°C).....:		N
A.1.3/RD	Mounting of samples.....:		N
A.1.4/RD	Test flame (see IEC 60695-11-3)		N
	Flame A, B, C or D .....:	N.A	—
A.1.6/RD	Compliance criteria		N
	Sample 1 burning time (s).....:	N.A	—
	Sample 2 burning time (s).....:	N.A	—
	Sample 3 burning time (s).....:	N.A	—
A.2/RD	Flammability test for fire enclosures of movable equipment having a total mass not exceeding 18 kg, and for material and components located inside fire enclosures (see 4.7.3.2 and 4.7.3.4)		N
A.2.1/RD	Samples, material..... :	Metal enclosure	—
	Wall thickness (mm)..... :	N.A	—
A.2.2/RD	Conditioning of samples		N
A.2.3/RD	Mounting of samples		N
A.2.4/RD	Test flame (see IEC 60695-11-4)		N
	Flame A, B or C .....:	N.A	—
A.2.5/RD	Test procedure		N
A.2.6/RD	Compliance criteria		N
	Sample 1 burning time (s).....:	N.A	—
	Sample 2 burning time (s).....:	N.A	—
	Sample 3 burning time (s).....:	N.A	—
A.2.7/RD	Alternative test acc. to IEC 60695-2-2, cl. 4 and 8		N
	Sample 1 burning time (s).....:	N.A	—
	Sample 2 burning time (s).....:	N.A	—
	Sample 3 burning time (s).....:	N.A	—
A.3/RD	Hot flaming oil test (see 4.6.2)		N
A.3.1/RD	Mounting of samples		N
A.3.2/RD	Test procedure		N
A.3.3/RD	Compliance criterion		N

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Clause	Requirement – Test	Result – Remark	Verdict
B/RD	ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2)		N
B.1/RD	General requirements	No motor	N
	Position	N.A	—
	Manufacturer	N.A	—
	Type	N.A	—
	Rated values	N.A	—
B.2/RD	Test conditions		N
B.3/RD	Maximum temperatures		N
B.4/RD	Running overload test		N
B.5/RD	Locked-rotor overload test		N
	Test duration (days)	N.A	—
	Electric strength test: test voltage (V)	N.A	—
B.6/RD	Running overload test for d.c. motors in secondary circuits		N
B.7/RD	Locked-rotor overload test for d.c. motors in secondary circuits		N
B.7.1/RD	Test procedure		N
B.7.2/RD	Alternative test procedure; test time (h).....	N.A	N
B.7.3/RD	Electric strength test		N
B.8/RD	Test for motors with capacitors		N
B.9/RD	Test for three-phase motors		N
B.10/RD	Test for series motors		N
	Operating voltage (V)	N.A	—

C/RD	ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3) *Transformer is designed for operational insulation only. No safety isolation transformers used.separating transformer is CE approved*		P
	Position	T1	—
	Manufacturer	See table 4.3	—
	Type	See page 2 model difference	—
	Rated values	Class B	—
	Method of protection.....		—
C.1/RD	Overload test		P
C.2/RD	Insulation		P
	Protection from displacement of windings.....	Bobbin and tapes	P

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Clause	Requirement – Test	Result – Remark	Verdict
D/RD	ANNEX D, MEASURING INSTRUMENTS FOR TOUCH-CURRENT TESTS (see 5.1.4)		P
D.1/RD	Measuring instrument		P
D.2/RD	Alternative measuring instrument		N
E/RD	ANNEX E, TEMPERATURE RISE OF A WINDING (see 1.4.13)		N
F/RD	ANNEX F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10)		P
G/RD	ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES		N
G.1/RD	Summary of the procedure for determining minimum clearances		N
G.2/RD	Determination of mains transient voltage (V)....		N
G.2.1/RD	AC mains supply		N
G.2.2/RD	DC mains supply		N
G.3/RD	Determination of telecommunication network transient voltage (V).....		N
G.4/RD	Determination of required withstand voltage (V).....		N
G.5/RD	Measurement of transient levels (V).....		N
G.6/RD	Determination of minimum clearances.....		N
H	ANNEX H, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER AND FOREIGN OBJECTS (see IEC 60529)		N
J/RD	ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)		N
	Metal used	N.A	—
K/RD	ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.7)		N
K.1/RD	Making and breaking capacity		N
K.2 /RD	Thermostat reliability; operating voltage (V).....		N
K.3/RD	Thermostat endurance test; operating voltage (V)		N
K.4/RD	Temperature limiter endurance; operating voltage (V)		N
K.5/RD	Thermal cut-out reliability		N
K.6/RD	Stability of operation		N

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Clause	Requirement – Test	Result – Remark	Verdict
L	ANNEX L, BACKFEED PROTECTION TEST		P
L.1	General	Pluggable equipment type A	P
L.2	Test for pluggable equipment type A or pluggable equipment type B UPS		P
L.3	Test for permanently connected UPS		N
L.4	Single-fault conditions		P

M	ANNEX M, EXAMPLES OF REFERENCE LOAD CONDITIONS		N
M.1	General		N
M.2	Reference resistive load		N
M.3	Reference inductive-resistive load		N
M.4	Reference capacitive-resistive loads		N
M.5	Reference non-linear load		N
M.5.1	Test method		N
M.5.2	Connection of the non-linear reference load		N

N	ANNEX N, VENTILATION OF BATTERY COMPARTMENTS		N
N.1	General	Hermetic	N
N.2	Hydrogen concentration		N
N.3	Blocked conditions		N
N.4	Overcharge test		N

O	Guidance for disconnection of batteries during shipment		N
O.1	Applicable products		N
O.2	Battery disconnection		N
O.3	Package labelling/marking		N
O.4	Damage inspection		N
O.5	The importance of safe handling procedures		N

4.3	TABLE: list of critical components All safety critical components should be approved, like power cord and sets, appliance inlet, X-cap, varistor, opto coupler, relay, PCB, internal wire etc	P

object/part No.	manufacturer/ trademark	type/model	technical data	stan dard	mark(s) of conformity[1])
Front panel enclosure, LED cover and LCD Lens	CHI MEI CORPORATION	PA-765	80°C, V-1	UL 746	UL E56070
Plug	Ching Cheng Wire Material Co., Ltd.	EL-202	16A 250V~	EN 50075	VDE 40004661
	Ching Cheng Wire Material co.,Ltd	EL210	13A 250V~	BS 1363	KM39096
	Ching Cheng Wire Material Co.	EL-211	16A 250V~	EN 50075	VDE 40000947
Flexible cord	Shenzhen Bao Hing Electric Wire & Cable Manufacture Co. Ltd.	H05VV-F	3 x 1.5mm^2	VDE 0281	VDE 103727
(alternative)	Shenzhen Bao Hing Electric Wire & Cable Manufacture Co. Ltd.	H05VV-F	3 x 1.5mm^2	VDE 0281	VDE 131689
(alternative)	Ching Cheng Wire Material Co.	H05V V-F	3 x 1.5mm^2	VDE 0281	VDE 131809
Power cord	SHENZHENG BAOHING ELECTRIC WIRE AND CABIE MANUFACTUR E CO.,LTD	H05VV-F	3 x 1.5mm^2	VDE 0620	VDE 131689
	YUHAO ELECTRIC MANUFACTUR E CO.,LTD	H05VV-F	3 x 1.5mm^2	VDE 0281	40027906
Appliance inlet	Dongguan Nanke Electronic MFG Factory	XD-102	10A 250V~	EN 60320-1	VDE 40023560
(alternative)	Rong Feng Industrial Co., Ltd.	RF-2004	10A 250V~	EN 60320-1	VDE 40012427

object/part No.	manufacturer/ trademark	type/model	technical data	stan dard	mark(s) of conformity[1])
Connector	Ching Cheng Wire Material Co.	EL-701	10A 250V~	--	VDE 40014003
Socket outlet 1	Dongguan Nanke Electronic MFG Factory	SS-180	10A 250V~	EN 60320-1	VDE 40023886
(alternative)	Rich Bay Co., Ltd.	R-302SN	10A 250V~	EN 60320	VDE 40006954
(alternative)	Rong Feng Industrial Co., Ltd.	SS-130	10A 250V~	EN 60320	VDE 40009225
Socket outlet 2	Rich Bay Co., Ltd.	R-302G3	10A 250V~	VDE 0620-1	VDE 40011561
(alternative)	Rong Feng Industrial Co., Ltd.	742W-3P	10A 250V~	VDE 0620-1	VDE 40009672
(alternative)	Rich Bay Co., Ltd.	RG-02	10A 250V~	VDE 0620-1	VDE 82796
(alternative)	Rong Feng Industrial Co., Ltd.	E-08	10A 250V~	VDE 0620-1	VDE 40008508
(alternative)	RONG FENG INDUSTRIAL CO.	E-08D	10A 250V~	VDE 0620-1	VDE 40008508
Fuse	Suzhou Littelfuse OVS Ltd.	218-series	250V, 10A 250V, 15A	EN 60127-1	VDE 40013496
Fuse holder	Littelfuse Inc.	345121	250V, 10A	EN 60127-6	VDE 40018957
Battery	SHEN ZHEN SUNNYWAY BATTERY TECH CO.,LTD	UN7-12 UN8-12	12V, 8AH, 12V, 7AH	UL 1989	MH21285
Relay	GOLDED	GH-1C-12L	6A 250VAC 12VDC	EN 60255	TUV R50079239
(alternative)	GOLDED	GJ-1C-12L	10A 250VAC 12V	EN 61810-1	TUV R50164189
(alternative)	TAIWAN SHORI ELECTRIC CO.,LTD	S3-12/24	10A 240VAC 12/24VDC	EN 60255	TUV R9754312
		S7-12/24	12A 240VAC 12/24VDC	EN 60255	TUV R9854359
(alternative)	SHORI	S3-12	10A 240VAC 12VDC	EN 60255	TUV R9754312

object/part No.	manufacturer/ trademark	type/model	technical data	stan dard	mark(s) of conformity[1])
(alternative)	Ningbo shoi	S3-12/24	10A 240VAC 12/24VDC	EN 60255	TUV 50118517
(alternative)	SONGCHUAN	833H-1C-C-DC12V/24V	10A 240VAC 12V/24DC	EN 60255	TUV R9754206
		812	10A 250V, 12VDC	EN 60255	TUV50041911
		845N	10A 250VAC 6VDC/12V	EN 60255	TUV R9754104
		875	10A, 250VAC 12VDC	EN 60255	TUVR3-50006128
		845N-2C-C	5A 250VAC 6VDC	EN 60255	TUV R9754104
Internal wire (Battery used)	EVER BRIGHT(HK)DEVELOPMENT CO LTD	1015	10AWG, 600V	UL 758	UL E191230
(alternative)	ZI LI ELECTRONIC CO LTD	1015	10AWG, 600V, 105°C	UL 758	UL E254016
Transformer	Guangdong East Power Co.,Ltd.	EA / BE Series	Class B	--	Test with appliance
--Thermal protectors	Changzhou Changhong Tongli Electrical Appliance Co., Ltd	KW- Series	5-15A 250V~ 150°C	EN60730-1 EN60730-2-2	40020906
(alternative)	FOSHAN CHAN CHENG EAGLE TECHNOLOGY CO LTD	AMT-11*, AMT-22*,	5-15A 250V~ 150°C	UL 873	E301742
(alternative)	YANGZHOU WUYUE ELECTRONIC CO.,LTD	17AME/ 15AME	5-15A 250V~ 150°C	UL873	E258612
--Insulating Tape	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD	CT, PZ	130°C	UL510	E165111
(alternative)	JINGJIANG JINGYANG INSULATING PRODUCT CO LTD	JY-133	130°C	UL510	E309872

object/part No.	manufacturer/ trademark	type/model	technical data	stan dard	mark(s) of conformity[1])
--Paper Insulating Tape	XINFENG GHILLIE ELECTRICAL MATERIALS CO LTD	JL-T4	180°C	UL510	E326305
--Bobbin	Pinghu Meishen Electric apparatus Co.,ltd	Radiflam A AE(a) C	125°C	UL 746	E116324
--Magnet wire	ROSHOW TECHNOLOGY CO LTD	xUEW/130 or QA-x/130	130°C	UL1446	E215691
	ROSHOW GROUP CO LTD	QZ-x/130	130°C	UL1446	E215691
--Down-lead	ZHONG SHAN YONG ROI ELECTRIC FACTORY CO LTD	1015	105°C, 18AWG	UL758	E204893
Switch	Various	Various	250V, 10A, min. 70°C	--	VDE
[1]) an asterisk indicates a mark which assures the agreed level of surveillance					

4.4	TABLE: electrical data (in normal conditions)	P

fuse #	Irated (A)	U (V)	Power (W)	I (A)	Ifuse (A)	condition/status
FUSE	--	198/50Hz	1875	9.54	9.54	Output load 8.0A
FUSE	--	198/60Hz	1873	9.45	9.45	Output load 8.0A
FUSE	10	220/50Hz	1860	8.70	8.70	Output load 8.0A
FUSE	10	220/60Hz	1860	8.69	8.69	Output load 8.0A
FUSE	10	240/50Hz	1850	7.65	7.65	Output load 8.0A
FUSE	10	240/60Hz	1849	7.65	7.65	Output load 8.0A
FUSE	--	254/50Hz	1806	7.18	7.18	Output load 8.0A
FUSE	--	254/60Hz	1805	7.11	7.11	Output load 8.0A
F1, F2	--	DC24V	2253	93.9	93.9	Output load 8.0A

5.1.2	TABLE: distance through insulation measurements	N

distance through insulation di at/of:	Up (V)	test volt age (V)	required di (mm)	di (mm)
--	--	--	--	--

5.1.4	TABLE: Backfeed protection test			P
Condition	Voltage measured (V)			Comments
	L-N	L-G	N-G	
No load	5.9	9.2	18	--
Full load	1.5	30	27	--

5.3 and 2.4/RD	TABLE: limited current circuit measurement					N
Location	Voltage (V)	Current (mA)	Freq. (Hz)	Limit (mA)	Comments	
--	--	--	--	--	--	
Output measured with a 2 KΩ resistor as under backup mode.						

5.7 and 9	TABLE: clearance and creepage distance measurements					P
clearance cl and creepage distance dcr at/of:	Up (V)	U r.m.s. (V)	required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)
Live part to metal enclosure	340	240	2.0	3.5	2.5	3.5
Live part to SELV circuit	340	240	4.0	6.5	5.0	7.0

5.7, 6, 8.2 and 9	TABLE: electric tests, impulse tests and voltage surge tests	P
test voltage applied between:	test voltage (V) a.c. / d.c.	breakdown Yes / No
Live parts to earthed pin of inlet	1500VAC	No
Live parts to metal enclosure	1500VAC	No
Live parts to front panel with metal foil	3000VAC	No
Live parts to SELV circuit	3000VAC	No

7.5	TABLE: resistance to fire			P
part	manufacturer of material	type of material	thickness (mm)	flammability class
Front panel	CHI MEI CORPORATION	PA-765	2.0	V-1

7.5 and 8.3	TABLE: fault condition tests		P
	ambient temperature (°C) .....:	24.6	—
	model/type of power supply ..... :	3000VA	—
	manufacturer of power supply ..... :	--	—
	rated markings of power supply .....:	--	—

com pone nt No.	fault	test vol tage (V)	test time	fuse No.	fuse cur rent (A)	result
Output	Short circuit	240	1s.	FUSE	7.65 to 0	FUSE opened immediately. No hazards.
Output	Overload	240	5h.	FUSE	7.65 to 8.0 to 8.6 to 0	Unit shutdown, recoverable after the fault removed. Max. output current: 9.2A, T1 winding temperature: 96.5°C, ambient: 26.5°C. No hazards.
Openings	Block	240	3h.	FUSE	7.65 to 7.65	T1 winding temperature: 59.8°C, Ambient temperature: 21.6°C, unit normal operation. No hazards.
D51	Short circuit	240	5h.	FUSE	7.65 to 9.3A to 5.5	T1 winding temperature: 169°C, Ambient temperature: 24.9°C, circling operation: 15min. 20min. OFF, No hazard.
Q2 pin D and pin G	Short circuit	Battery mode	1s	F1, F2	93.9 to 0	F1 & F2 opened, no hazardous.
Q2 pin D and pin S	Short circuit	Battery mode	1s	F1, F2	93.9 to 0	F1 & F2 opened, no hazardous.
Q2 pin S and pin G	Short circuit	Battery mode	10min.	F1, F2	93.9 to 0	Unit shutdown immediately, recoverable after the fault removed. No hazards.
Remark:						

7.7	TABLE A: maximum temperatures			P
test voltage (V)	AC198	AC254	Battery discharge	—
t_{amb1} (°C)	See below	See below	See below	—
t_{amb2} (°C)	See below	See below	See below	—

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Project Engineer: Grace Feng
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maximum temperature T of part/at::	T(°C) Measureed	T(°C) Normalized	T(°C) Measured	T(°C) Normalized	T(°C) Measured	T(°C) Normalized	allowed dTmax (°C)
1.power cord	39.4	57.6	34.5	53.6	39.2	57.8	70
2.switch body	37.3	55.5	32.8	51.9	37.6	56.2	70
3.Lead wire of Main transfoemer	45.1	63.3	37.7	56.8	57.6	76.2	105
4.Main transformer winding	64.5	82.7	55.8	74.9	73.9	92.5	AC: 110 DC: 142
5.Main transformer core	63.9	82.1	54.4	73.5	63.6	82.2	AC: 110 DC: 142
6.Battery near main transfoemer	34.6	52.8	29.6	48.7	36.4	55	Ref.
7.wire of Battery	26.5	44.7	24	43.1	44	62.6	105
8.PCB under D3	54.4	72.6	33.8	52.9	50.2	68.8	130
9.Relay J2	51.1	69.3	55.7	74.8	51.6	70.2	110
10.Relay J7	70.6	88.8	55.4	74.5	70.3	88.9	110
11.T1 winding	58.7	76.9	68	87.1	57.5	76.1	AC: 110 DC: 142
12.T1 core	57.4	75.6	63.9	83	57.3	75.9	AC: 110 DC: 142
13.PCB under Q4	39	57.2	35.1	54.2	58.6	77.2	130
14.PCB under D50	63.6	81.8	55.3	74.4	65.8	84.4	130
15. Relay J6	55.7	73.9	49.8	68.9	56.3	74.9	110
16.CN5 body	52	70.2	44.2	63.3	52.2	70.8	105
17.CN3 Body	77.3	95.5	62.6	81.7	77.3	95.9	105
18.AC outlet	33.6	51.8	32	51.1	33.4	52	70
19. Metal enclosure outside	38.6	56.8	35.5	54.6	37.7	56.3	60
20. Plastic panel inside	41.3	59.5	38.8	57.9	41	59.6	80
21. Plastic panel outside	35.9	54.1	36.1	55.2	34.2	52.8	80
22.Ambient	21.8	40	20.9	40	21.4	40	--

maximum temperature T of part/at::	T(°C) Measureed	T(°C) Normalized	T(°C) Measured	T(°C) Normalized	T(°C) Measured	T(°C) Normalized	allowed dTmax (°C)

temperature T of winding:	R_1 (Ω)	R_2 (Ω)	T (°C)	allowed T_{max} (°C)	insulation class
--	--	--	--	--	--
--	--	--	--	--	--

7.7	TABLE B: ball pressure test of thermoplastic parts		P
	allowed impression diameter (mm) .....:	≤ 2 mm	—

part	test temperature (°C)	impression diameter (mm)
Bobbin of transformer	125	0.6
CN2	125	0.5

======End of Report======

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Model: 3000VA

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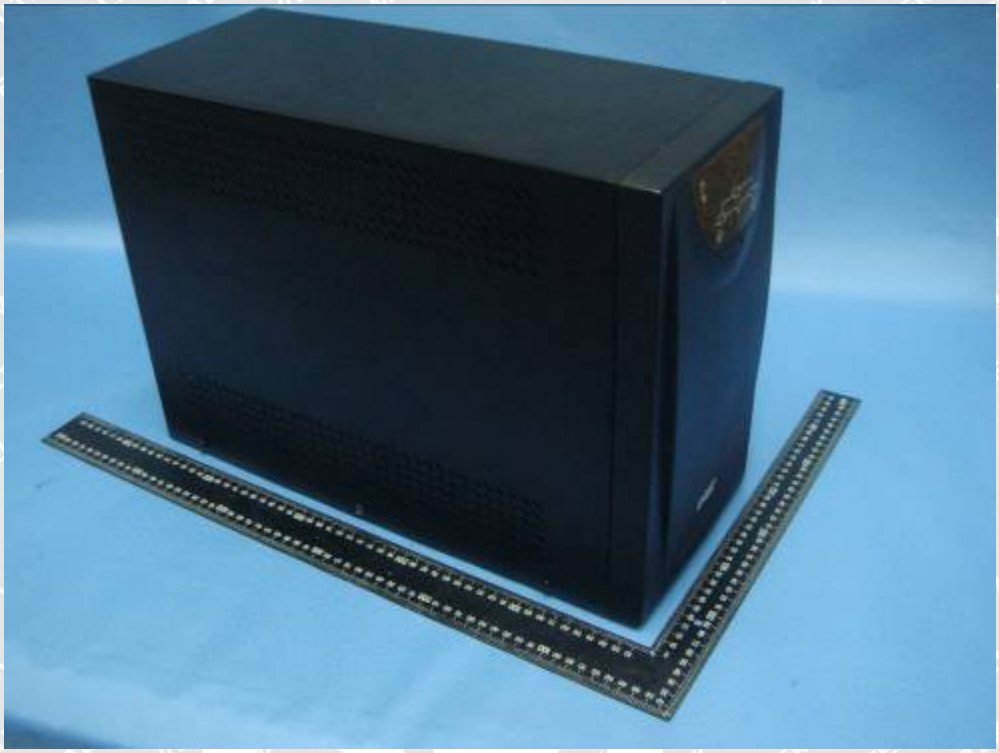

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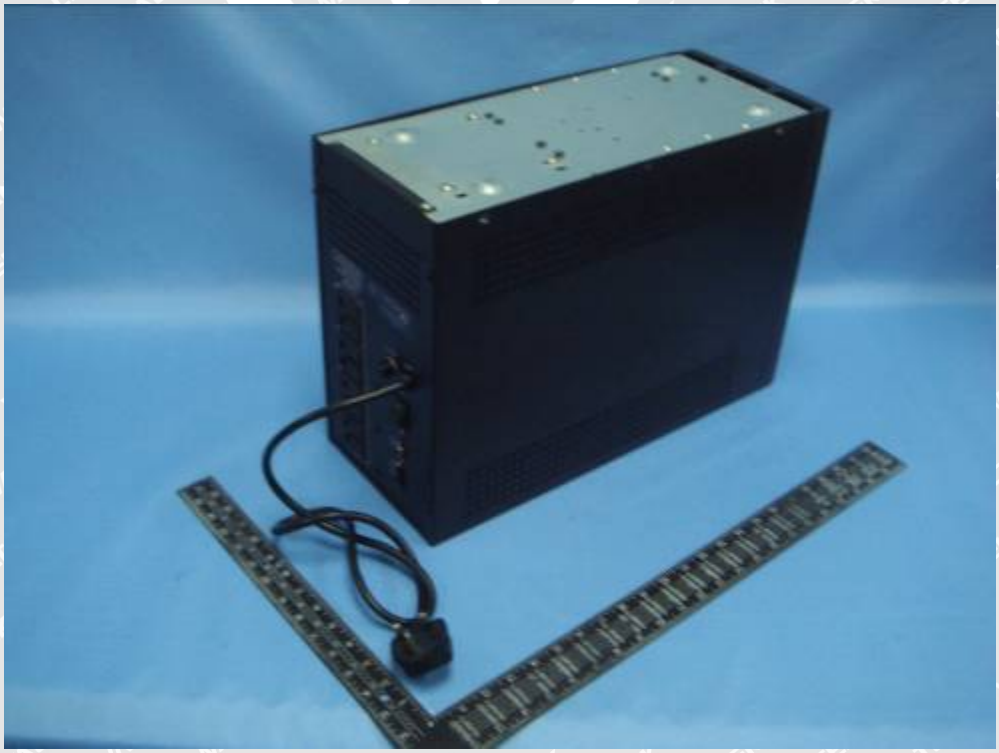

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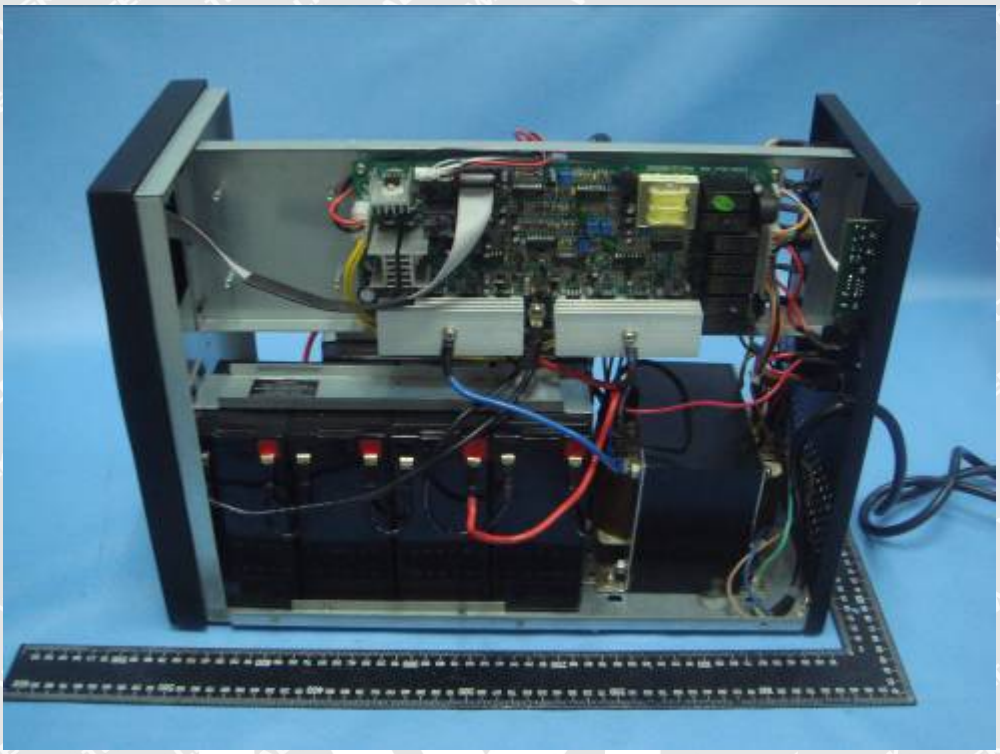
Photo Documentation

Reference No.: WTS14S0513591S



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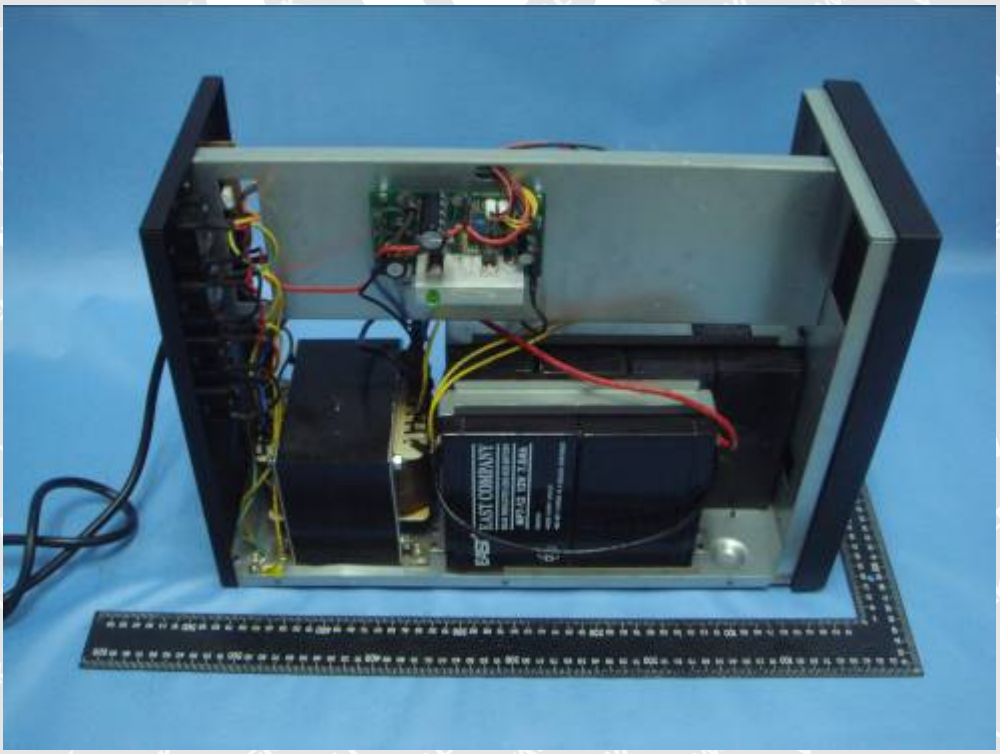

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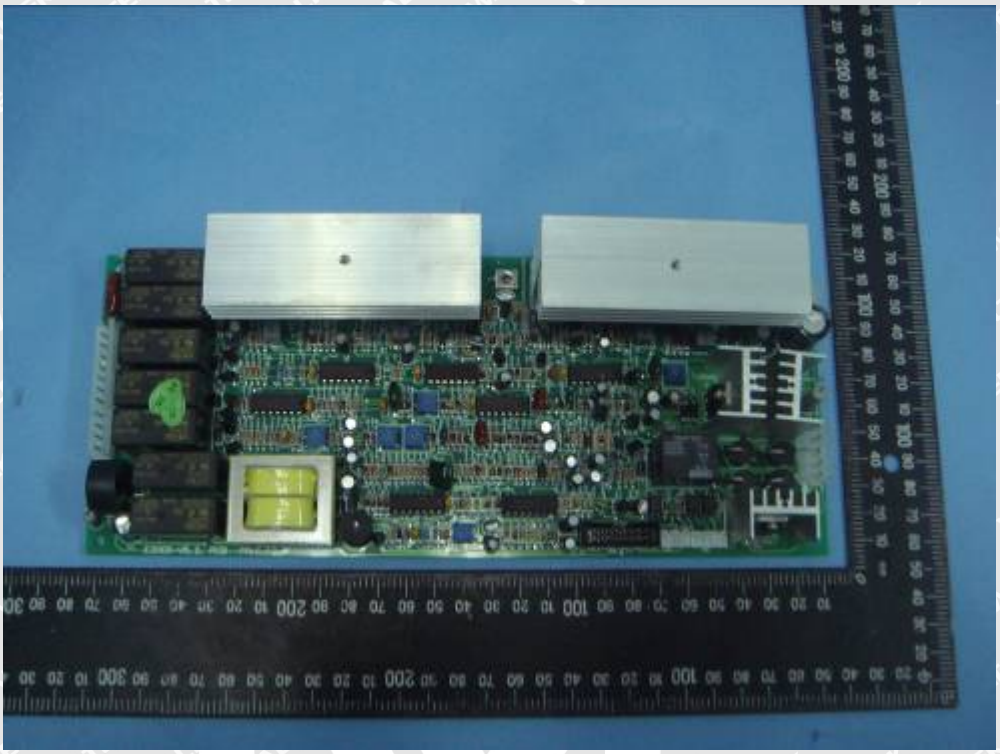

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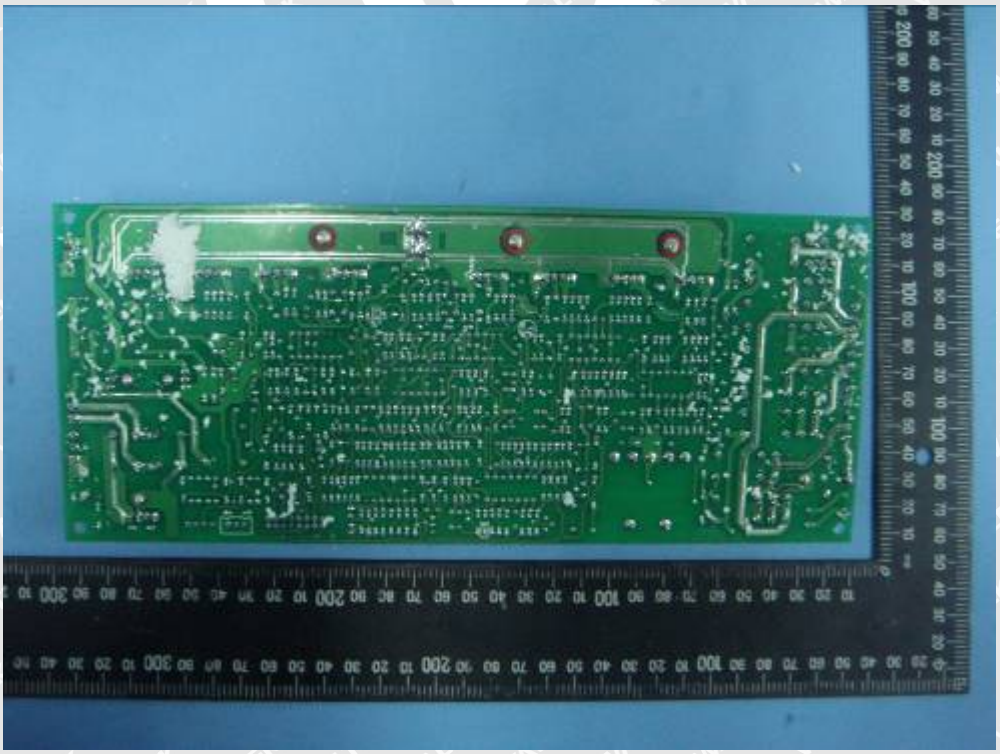

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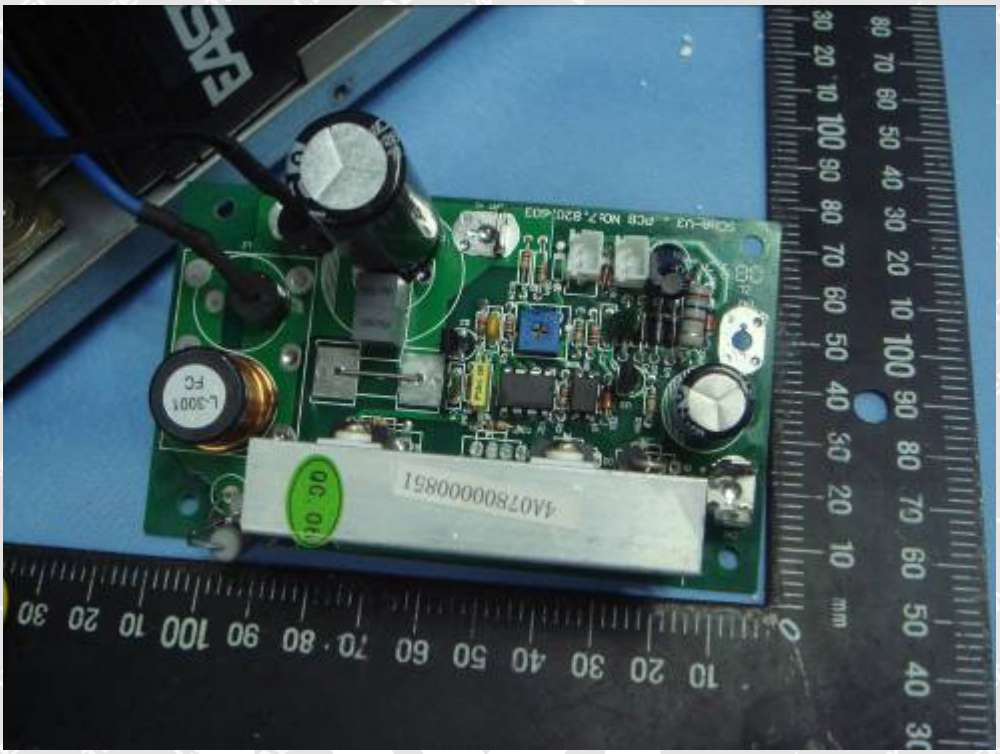

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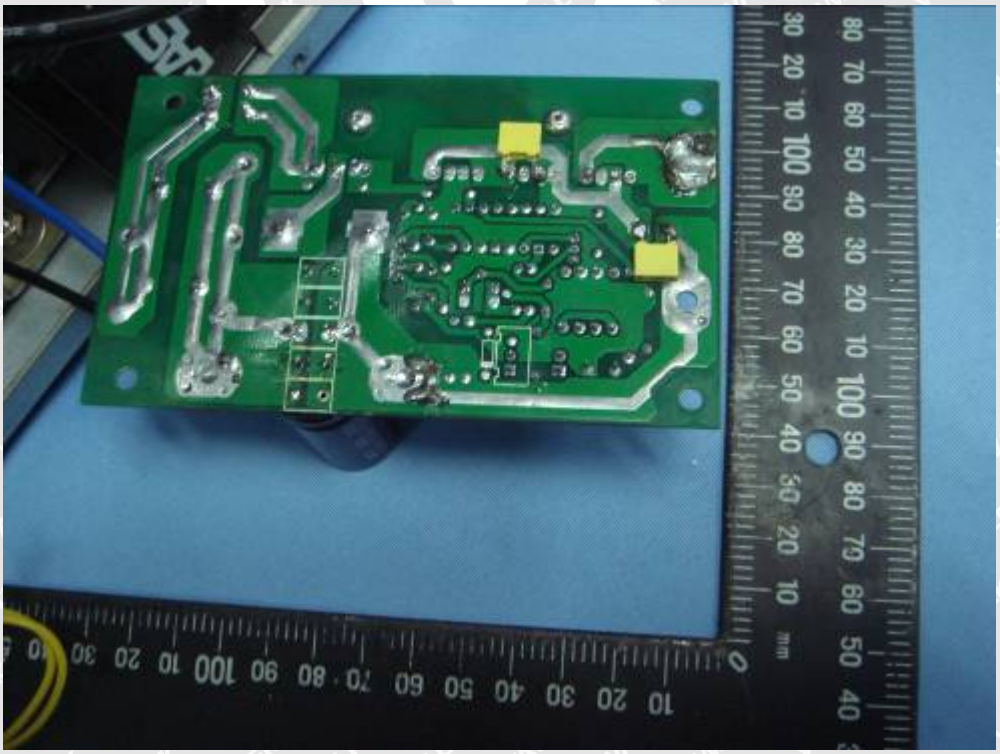

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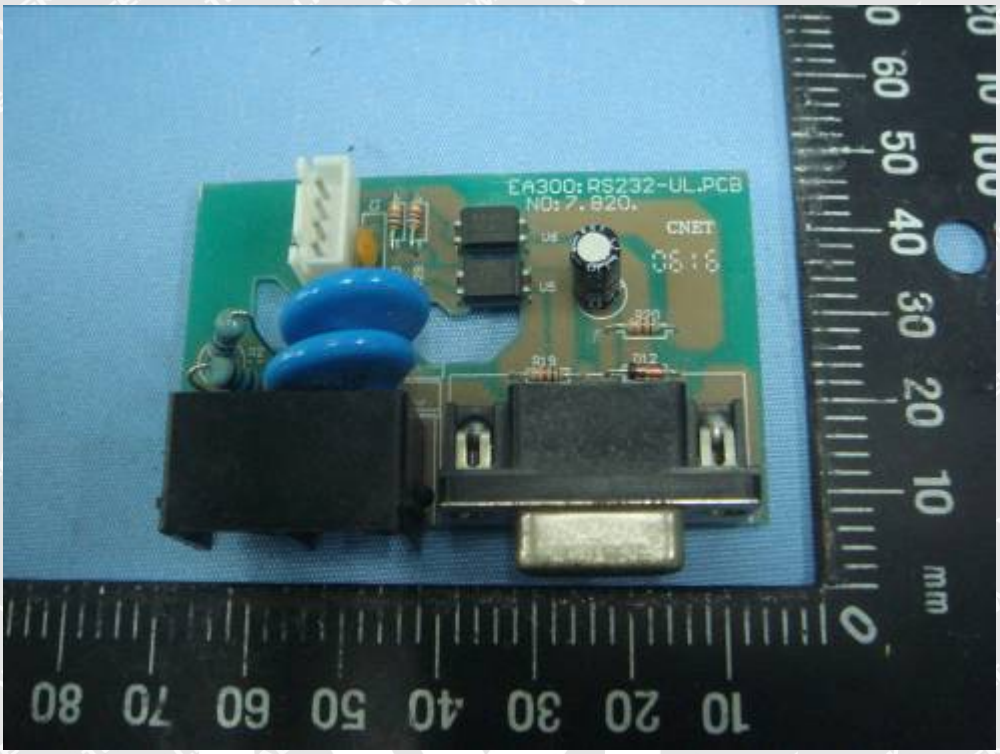

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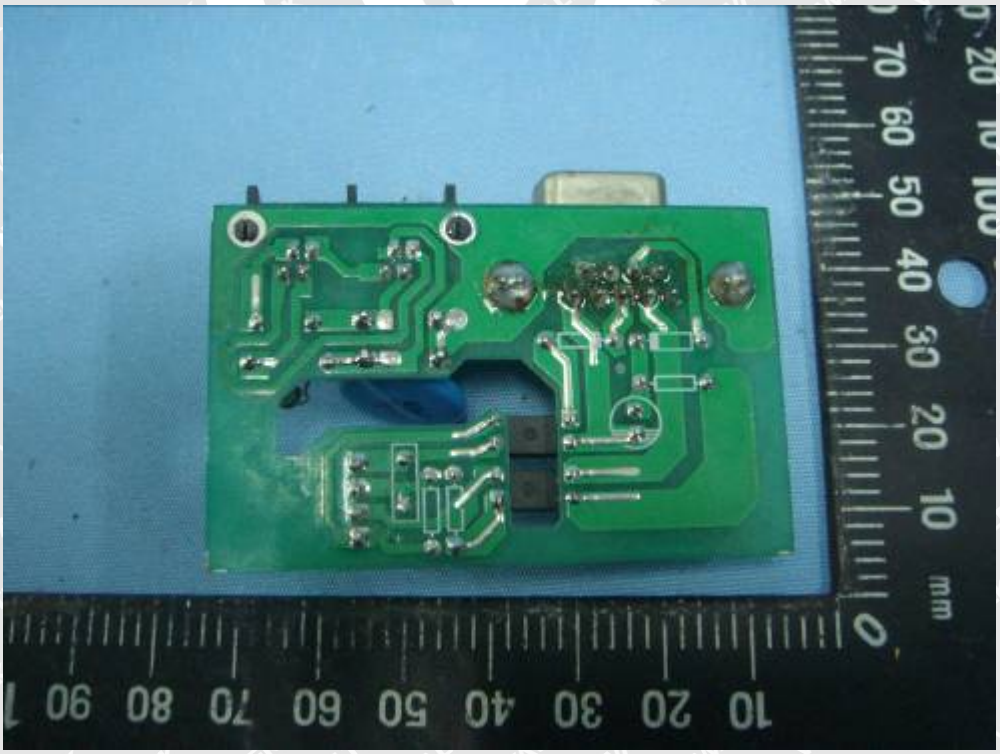

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